

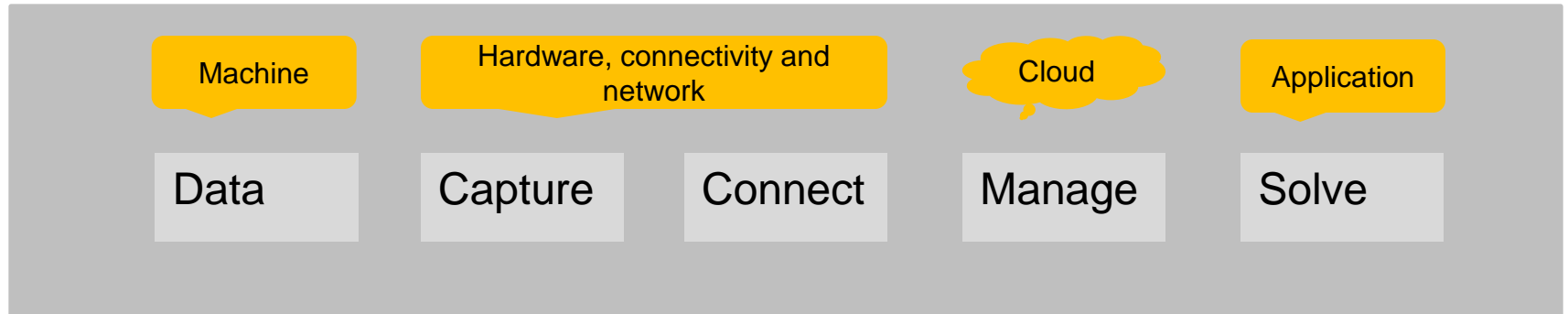
# IoT Device Development Challenges and Solutions



Venkat Mattela, CEO

- ▶ **IoT Bigger Picture**
- ▶ **IoT Current Challenges**
- ▶ **WyzBee® IoT Platform – What Is Unique?**
- ▶ **Development Process -- Product Synthesis**
- ▶ **Solution Demonstration**
- ▶ **QA**

# IoT Bigger Picture

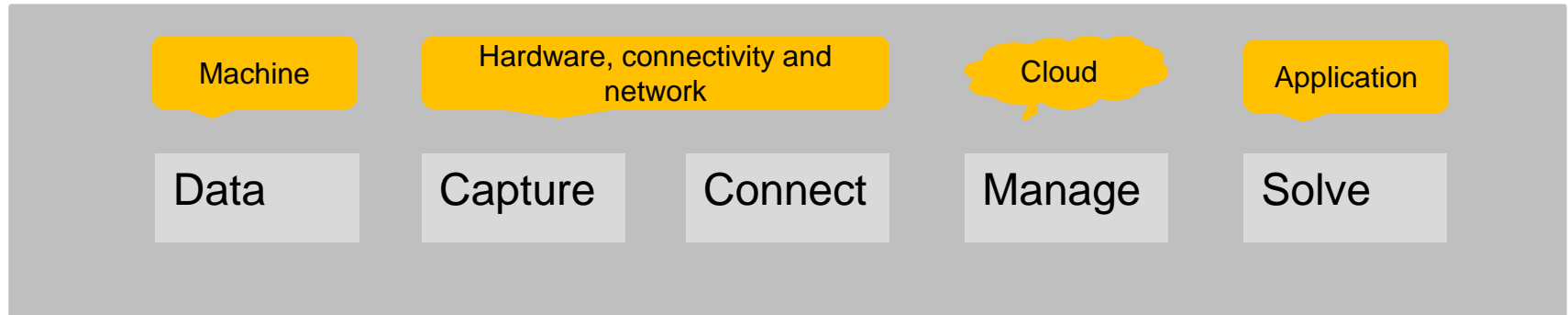


## Key Characteristics

- No or minimal human intervention during operation
- Minimal human intervention during configuration
- Long life time
- Security

Connecting and networking physical assets to Solve and Increase Business Efficiency

# Challenges



- ✓ Integration of hardware and software from several vendors
- ✓ Interaction with devices using multiple wireless protocols
- ✓ Real time data collection and Analytics
- ✓ Seamless and secure connection to Cloud
- ✓ Cost of design and deployment
- ✓ Remote device management and diagnosis
- ✓ Development tools



# WyzBee® Platform Overview

- ✓ Single Source Solution (Technology, Chipset, Module, Device and Cloud)
- ✓ Multi-Protocol Wireless Connectivity (DB Wi-Fi, BT EDR, BLE, ZigBee)
- ✓ Optimal cost of design and deployment: Product Synthesis with **THING** Interface
- ✓ Embedded Protocol, TCP/IP, SSL, HTTP, REST, SSL, PUF with seamless APIs
- ✓ Future proof devices

Sensors

Embedded Firmware



WyzBee® Workbench  
(Product Synthesis, Enhanced  
Debugger, Power Profiler)

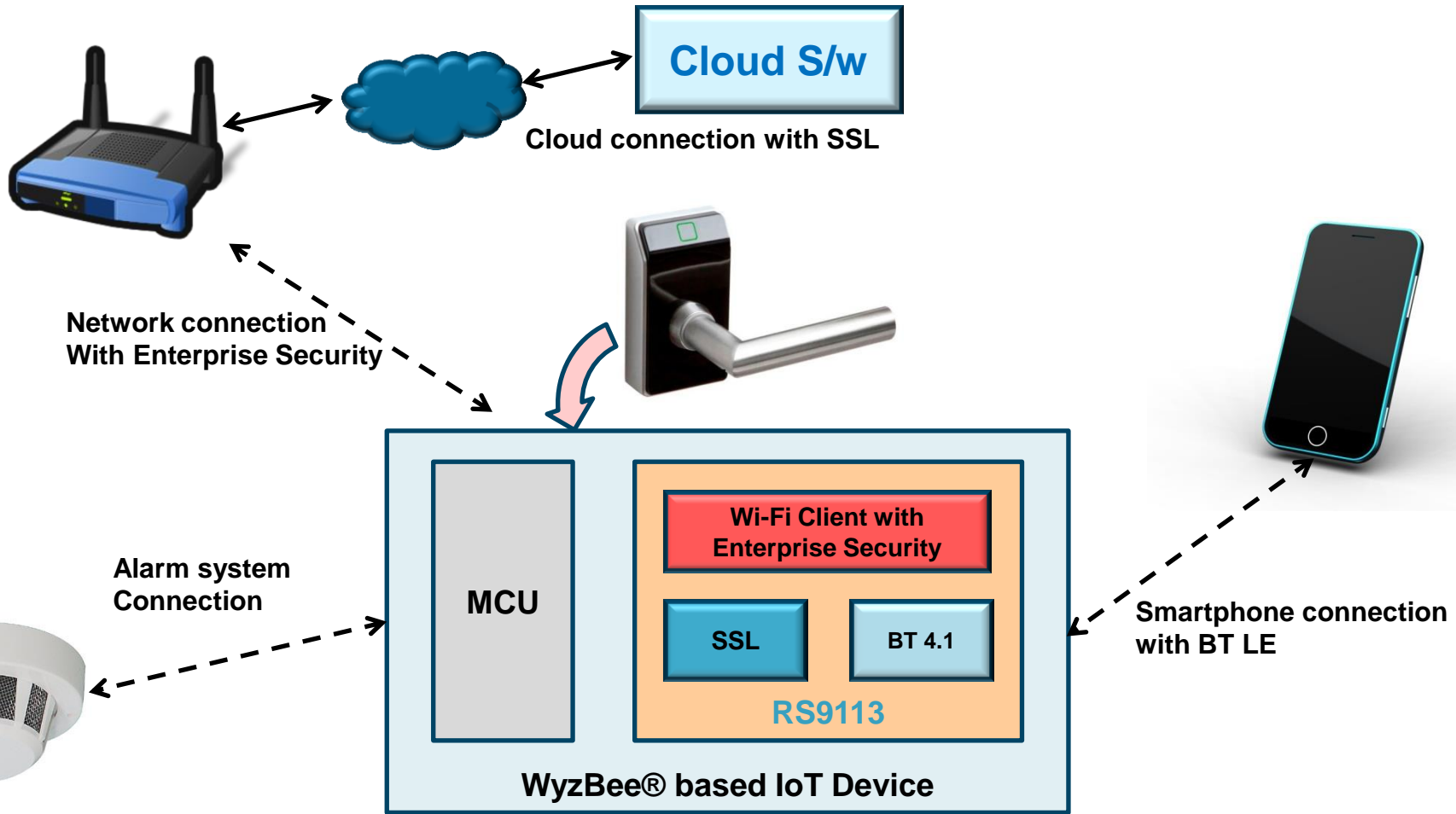
Redpine Cloud Platform

Wireless Secure MCU – WiSeMCU™ : Multi-protocol wireless ( Wi-Fi, BT 4.1, ZigBee Pro) Microcontroller (Cortex-M4)

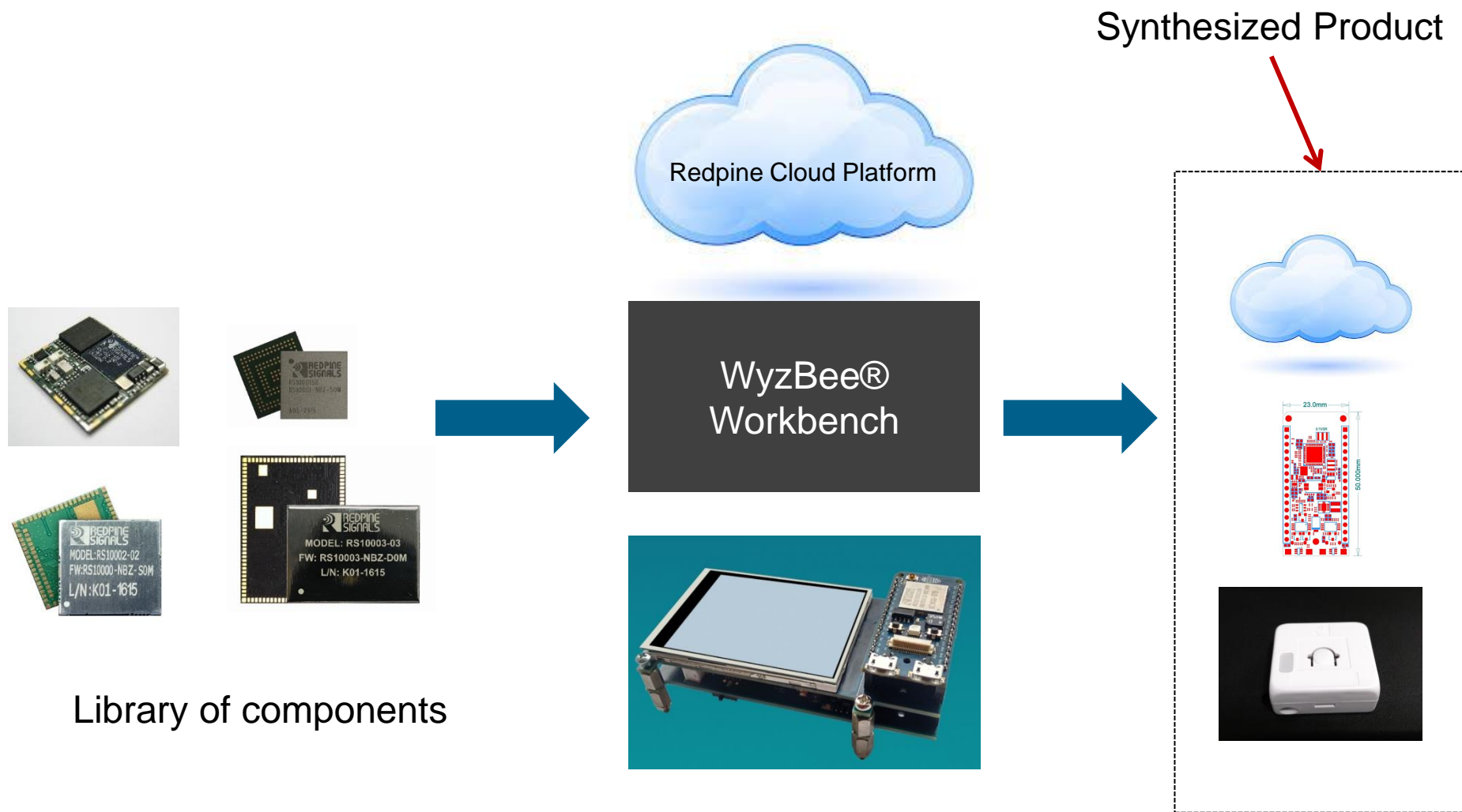
# WyzBee® Platform Unique Features- Single Source Solution

- ▶ All hardware and software for end to end application development
- ▶ Availability of 40+ THINGS for various sensor, audio, video and Locationing applications
- ▶ Connectivity using Wi-Fi, Bluetooth, BLE, ZigBee, GSM/GPRS, LTE
- ▶ Integrated stack components (Thread, 6LoWPAN, MQTT, CoAP, DTLS etc.) with APIs for seamless cloud connectivity
- ▶ Complete cloud infrastructure for visualization, device management, device monitoring and control
- ▶ Connectivity APIs to third party cloud solutions
- ▶ Application development kit for Android and iOS devices

# WyzBee® Platform Unique Features – Multi-Protocol Wireless



# WyzBee® Platform Unique Features – Product Synthesis





# WyzBee® Platform Unique Features – Product Synthesis



Hardware + Software



Cloud Integration



Application

1

Complete initial design using WyzBee

- ▶ Choose WyzBee “Things” to complete hardware and software design
- ▶ Choose WyzBee Cloud platform to complete the cloud integration (analytics, visualization, management etc.)
- ▶ Choose WyzBee Application platform to complete the application development

# WyzBee® Platform Unique Features – Product Synthesis

2

## Analyze and converge on system design

- ▶ Define power, performance, cost targets
- ▶ Define physical parameters (e.g. dimensions)
- ▶ Choose from library of components
- ▶ Complete trade-off analysis and finalize on components
- ▶ Choose the cloud integration elements
- ▶ Choose the application components

**Wireless Secure MCU – WiSeMCU™ M4, Multi-protocol wireless ( Wi-Fi, BT 4.1, ZigBee Pro)**



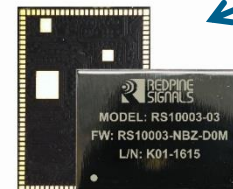
14mm x 15mm  
Multi-protocol, Fully  
Certified connectivity  
wireless module



8.6 mm \* 8.6mm  
M4/512KB Flash



14 mm \* 15mm  
M4/512KB Flash



15 mm \* 21mm  
M4/1MB

**Redpine Library Components (connectivity and WiSeMCU™ modules)**

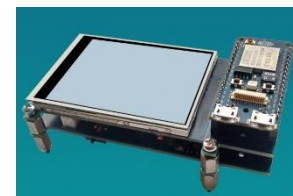
# WyzBee® Platform Unique Features – Product Synthesis

## 3 Synthesize the final design

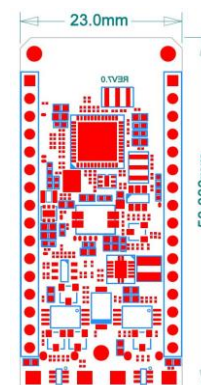
- ▶ Schematics, Gerbers
- ▶ PCB stack-up
- ▶ Mechanical drawing
- ▶ Bill of Materials
- ▶ Final performance, cost, power numbers
- ▶ Firmware image for WyzBee
- ▶ Cloud software
- ▶ Application software



WyzBee THING Boards



WyzBee Platform

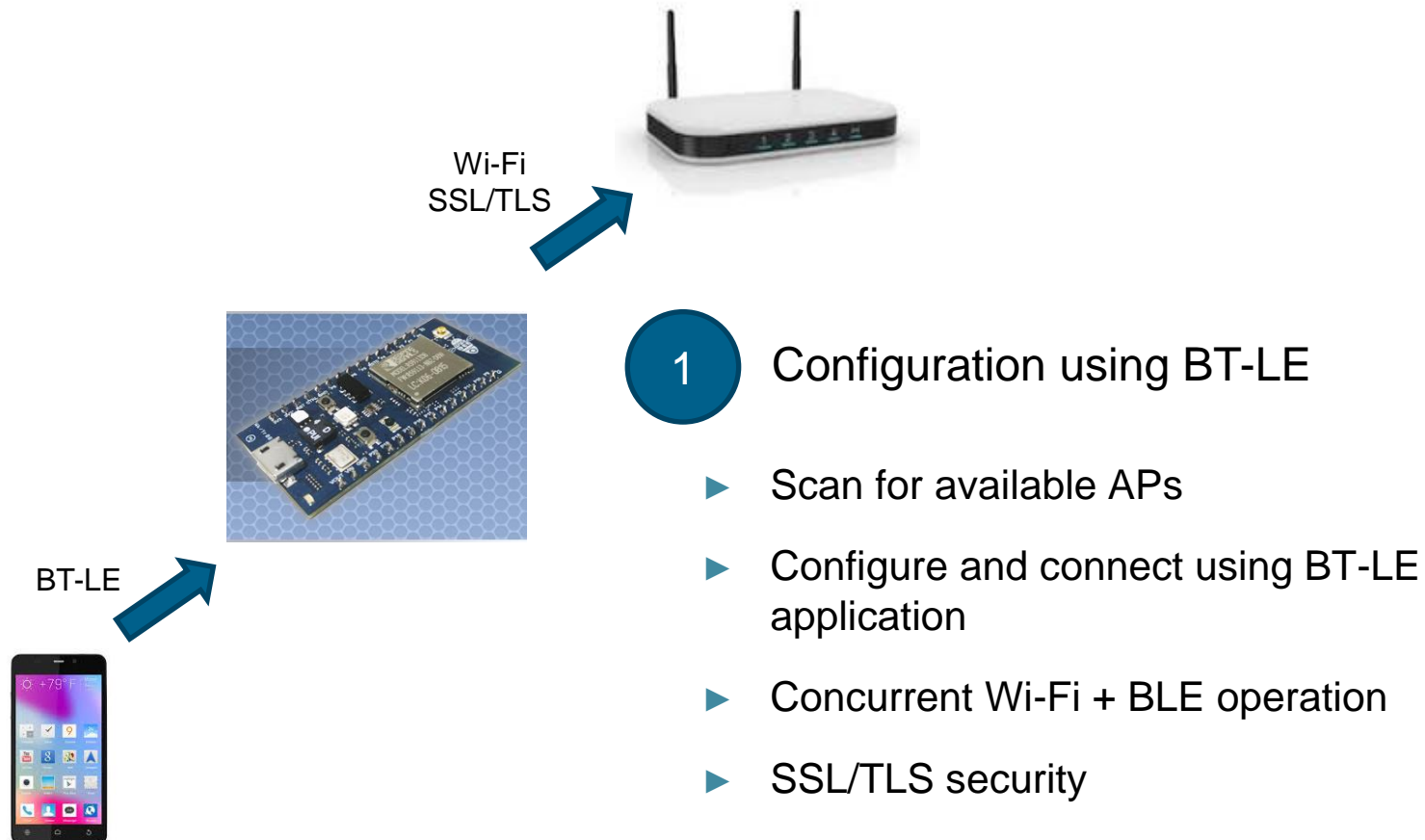


# WyzBee® Platform Unique Features- Embedded Software Stack

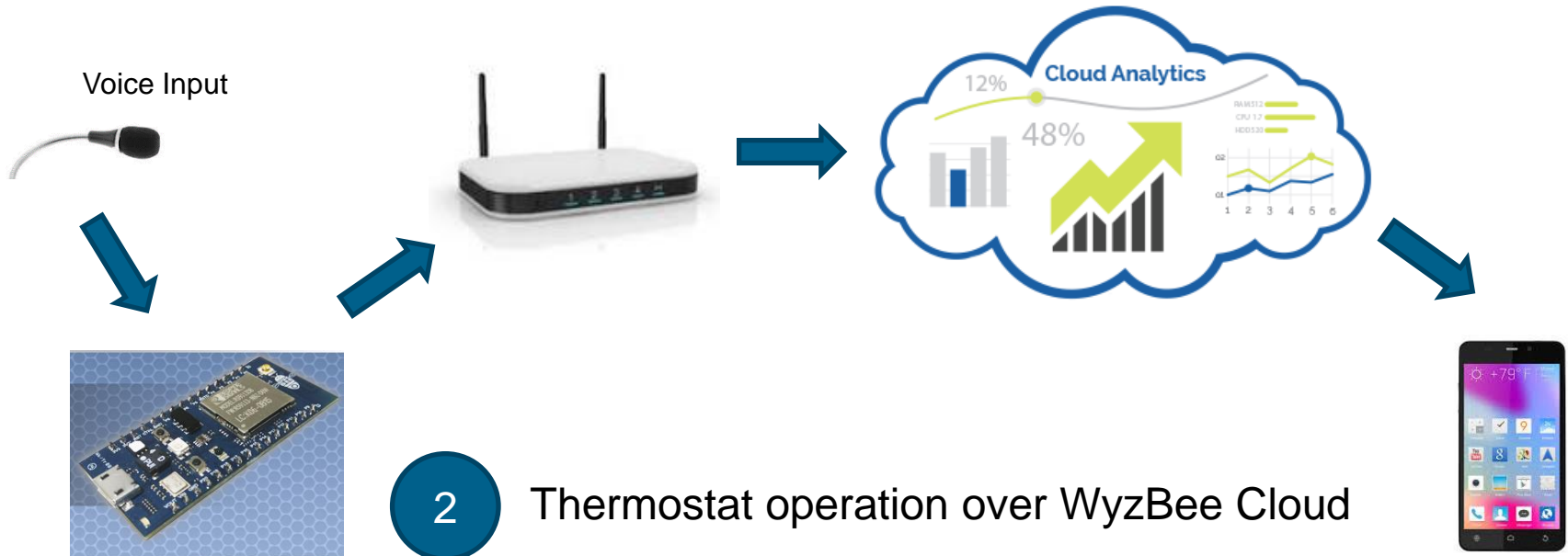
- ▶ Embedded multi-wireless protocol stacks for Wi-Fi, BT 4.1 Dual Mode and ZigBee with advanced security
- ▶ Support for advanced IoT stack components including Thread, 6LoWPAN, MQTT, CoAP and DTLS
- ▶ Support for 6LoWPAN over BLE and 802.15.4
- ▶ Complete networking stack including IPV6, SSL, TLS, HTTPS for secured connectivity
- ▶ REST APIs for cloud connectivity
- ▶ Embedded Oauth 2.0

- ▶ **WyzBee is a single stop shop for an IOT application development**
  - Provides significant reduction in time to market
  - Reduces cost of development and deployment
  - THING boards supported for realizing applications for all IoT market segments (connectivity, sensors, audio and video).
  - Seamless interface to Third-party cloud services
  - Easy application development framework
- ▶ **WyzBee provides secured connectivity with multi-wireless protocols**
  - Support for Wi-Fi, Bluetooth 4.1 Dual Mode, ZigBee
  - Advanced On-Chip PUF security for Device Authentication and hardware / software binding
- ▶ **WyzBee synthesizes the final product for you!**
  - Includes all hardware and software

# Product demo: Driving Wireless Convergence (Wi-Fi + BLE)



# Product demo: Voice Controlled Thermostat

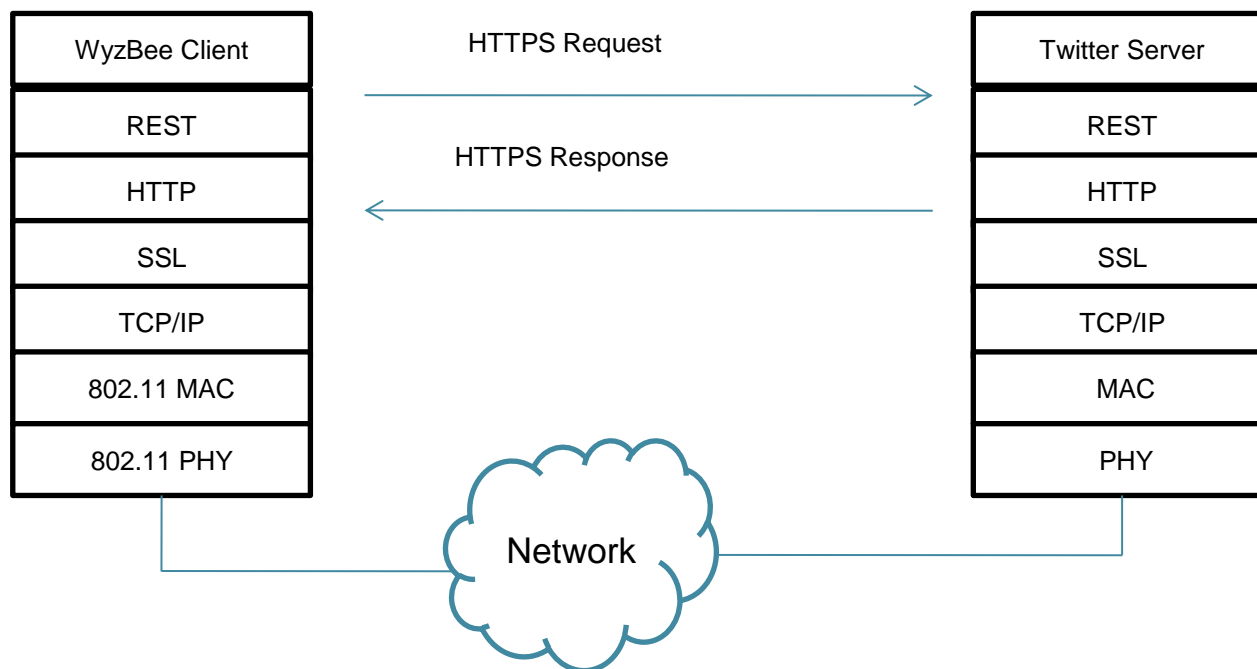


2

## Thermostat operation over WyzBee Cloud

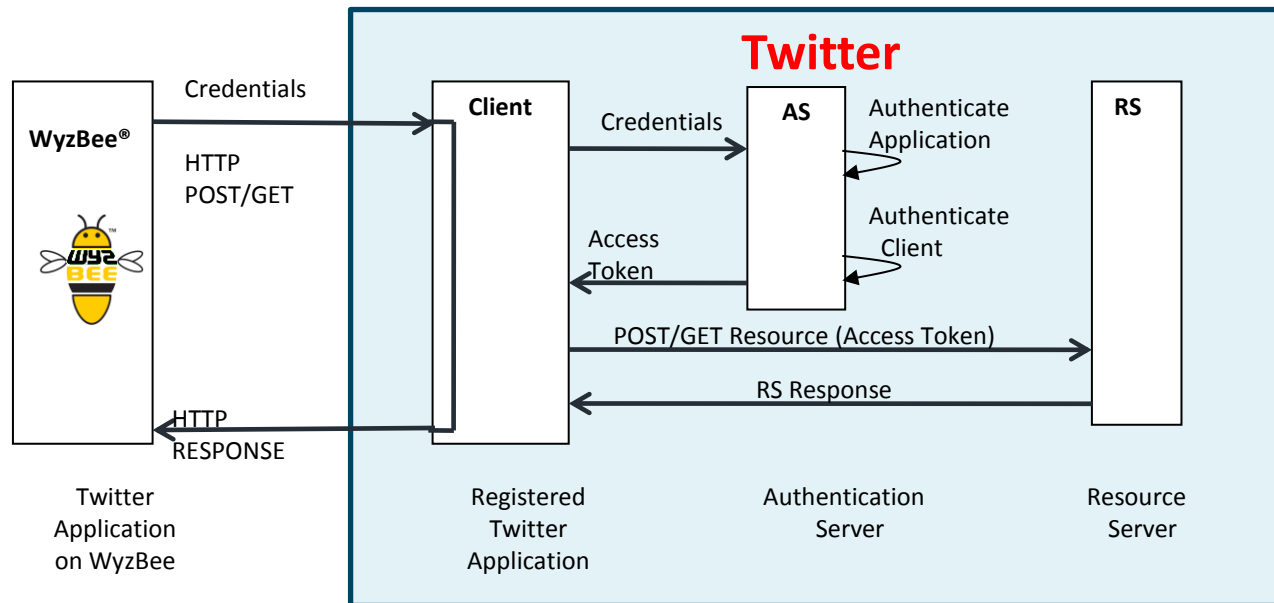
- ▶ Set contact information over the cloud
- ▶ Set threshold using voice or over the cloud
- ▶ Visualize and Analyze thermostat data
- ▶ MQTT, Rest APIs

# WyzBee® - Tweeting





# WyzBee® : Authentication for Twitter



Resource Owner(User):WyzBee platform running twitter application

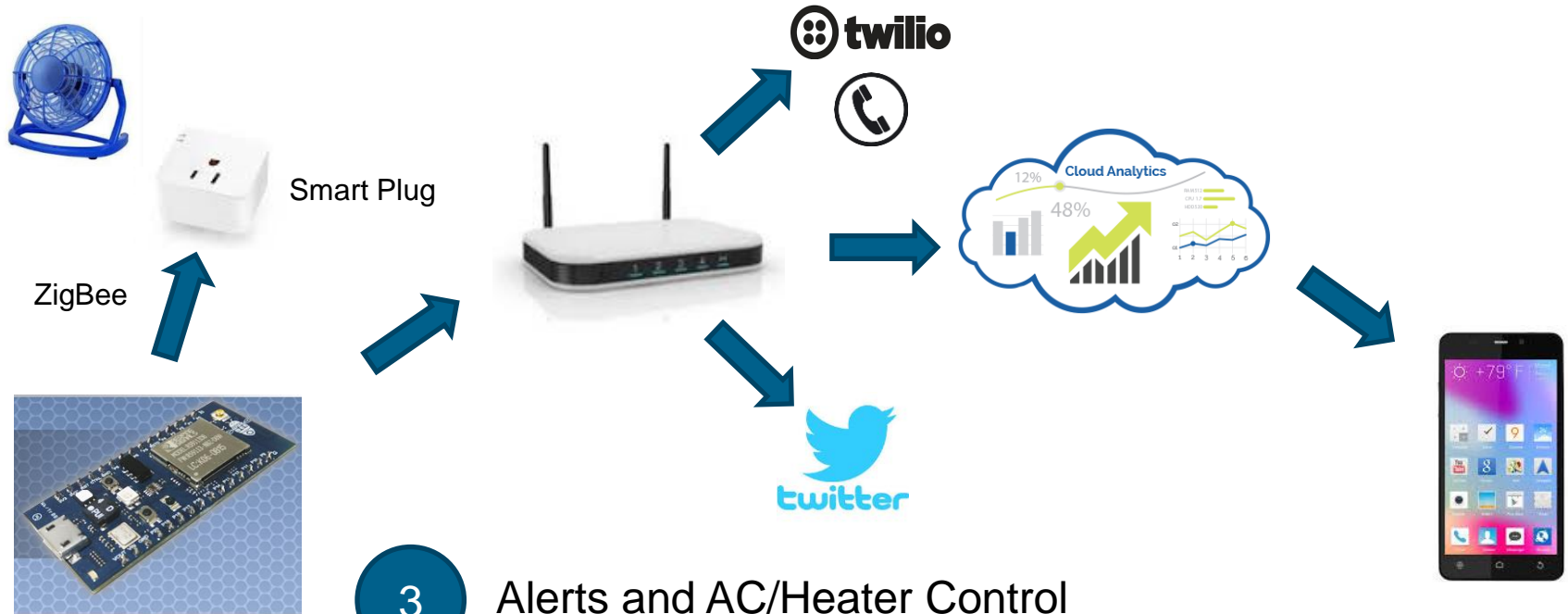
Client: Registered Twitter application(ex:WyzBeelot)

Authorization Server(AS): Authenticates user credentials

Resource Server(RS): Grants access to resources after authentication

AS and RS constitute Twitter service provider.

# Product demo: Driving Wireless Convergence (Wi-Fi + ZigBee)



3

## Alerts and AC/Heater Control

- ▶ Twilio phone call and Twitter (Oauth) alerts
- ▶ ZigBee for AC/heater control
- ▶ Concurrent Wi-Fi + ZigBee operation
- ▶ Multiple simultaneous sockets

DRIVING WIRELESS CONVERGENCE®

**THANK YOU**

Redpine Signals, Inc.